

Cracklin' Static

JANUARY 2019 Edition



Breakfast Meeting: Sat, Jan 5th.

Boomtown Casino Hotel
Events Center
I-80 at Exit 4 in Verdi

Breakfast Buffet – 7:30am - \$12
General Meeting – 8:00am

Barry Bettman K6ST will discuss
ARRL Kids Day (Jan 5)

SNARS NET on DMR – Tuesday 8pm

DMR Talk Group: 31328 SNARS

SNARS Treasury – As of Dec 28

Checking	\$8096
Savings	6262
Self Ins	2512
Convention	6221
PayPal	2586

Total \$25,677

SNARS Membership – ending Dec 27

General	93	26%
Technician	126	35%
Extra	123	35%
Advanced	14	4%

SNARS Members 356
ARRL Members 234

President's Voice

President John Byerly, N7ROJ

Email: mtnlion@gmail.com

I would like to thank both the outgoing and incoming board for their service to the club, and I would like to thank Tony W7XM for the path he has taken the club down.

It is my intent to keep moving in the same direction and I hope to have the same support you have given him.

As a club, we voted in the bylaw change that allows us to use electronic voting, or paper ballots for those who would prefer to use them. This will save the club money, and time in the election of board members.

Thank you all for your support. If you have anything you would like to discuss, I am readily available.

73, John/N7ROJ



Weekday on the SNARS Linked System

147.030 + PL 123 – Sparks/Fernley
 147.150 + PL123.0 – Lake Tahoe / Truckee
 147.210 + PL 100.0 - Reno
 444.875 + PL 100.0 - Yerington
 146.925 - 123.0 – Lovelock / Fallon
 146.67 – PL 123.0 - Winnemucca

Monday through Friday @ 12:00pm

Open to all amateur radio operators. A general informational net for the amateur radio community of Northern Nevada and Eastern California. Radio Checks and Questions are welcomed.

Nets on the SNARS Linked Systems

147.210 + 100.0 | 147.030 + 123.0 | 147.150 + 123.0
 147.670 – 123.0 | 146.925 – 123.0 | 444.875 + 100.0

Bishops Storehouse Net	Monday @ 9:15pm
N. Western NV ARES Net	Monday at 7:30pm
Northern Nevada Preppers Net	Wednesday @ 8:00PM
Hospital Net	Friday @ 10:00AM

Nets on IRLP (GSR) System

Repeater: 147.300 + 123.0

Amateur Radio Newslite	Monday - 8:00PM
Nevada Skywarn Net	Wednesday - 7:00pm
Nevada State ARES Net	Thursday - 7:00PM

Nets on Simplex/HF

Jefferson Noon Net	7.204 LSB	Daily - 12:00pm
6 Meter Net	50.350 USB	Tuesday – 8:00pm
2 Meter Week Signal	144.250 USB	Wednesday - 8:00PM
2 Meter Simplex Net	146.500 FM	Thursday – 8:00PM
10 Meter Net	28.350 USB	Sunday – 2:00PM

SNARS Weekly DMR Net – Tuesdays 8:00PM

SNARS Talk Group 31328

SNARS CALENDAR

Ham Radio Night at the REOC CANCELLED FOR JANUARY

ARRL Kids Day "Get the Kids on the Air" Saturday Jan 5 9:30 to ?Cabela's I-80 at Exit 4 Verdi

SCOUTS: "Get the SCOUTS on the Air" Saturday Jan 5 2PM to 4PM Cold Springs Valley Volunteer Fire Department, 250 South Avenue, Reno.

SNARS Board Meeting Wednesday January 9, 6 PM

BOYS & GIRLS CLUB "Get the BOYS & GIRLS on the Air" Friday January 11, 9AM to 11AM Boys & Girls Club of Truckee Meadows, 2680 E 9th St, Reno.

QCWA Nevada Chapter meeting Saturday, Jan 12, 2019, 11am – 12pm Famous Dave's Bar-B-Que, 4925 Kietzke Ln, Reno, NV

NVCON Planning Meeting Wednesday, Jan 23, 6 PM
 Washoe REOC 5195 Spectrum Blvd, Reno NV

Next SNARS Breakfast Meeting – Saturday Feb 2, 8 AM
 Boomtown Casino Hotel Events Center I-80 at Exit 4 Verdi

WELCOME NEW MEMBERS

DECEMBER 2018

James	Vaughn	WA7JV
William	Hooper	KJ7CIG
Fred	Svetz	KC6SNN
Albert	McCloskey	K7KFR
Nicholas	Tarbox	W0NCT
Ryan	Cooper	KJ7AJG
Don	Garrett	W6DSG
Kelly	Larson	KJ7CIE
Cecil	McCumber	
Ian	Billings	K6BIX

THE NAME OF THE GAME

Jim Shepherd, W6US nvjims@gmail.com

WHO HAVE I TALKED TO?

How many hams have you talked to on the air? What bands show your most activity? What countries, states, counties, zones and other geographic areas have you contacted? Logs are a way of keeping this information and allowing you to look up these facts.

Back in the dark ages, all hams were required to keep a written log of all contacts. This was before there were computers to help gather and retain the information. Active operators had stacks and stacks of logs dating back to their first QSO. Most hams could remember working their regular contacts and had added additional information to their logs as to XYL's name, the rigs used, and non-ham interests. Other contacts had just the basics. Sending QSL cards to new contacts required a 'Callbook', a phonebook sized listing of all the active hams in the world with their addresses. New versions came out each year and old ones were kept as additional resources.

The advent of the personal computer made great changes in keeping logs. The FCC finally dropped the requirement to log all contacts and only required log keeping for special situations like experimental use of different bands and modes. The computer allowed keeping a log that could be searched for information. It also allowed the Callbooks to be purchased in an electronic format that could be combined to interface with the new logging programs. All of a sudden, you were greeted by your name by hams who you had never worked before. It wasn't long until the callbooks ended up on the Web and the programs became more powerful allowing a summary of all the contacts you had ever made with the other ham.

The latest improvement has been the 'cloud' repository of logs and the matching of QSOs with other hams. The ARRL's Logbook of the World (LOTW) is the best one out there and is an easy way to confirm contacts and go for operating awards.

(Ed note: visit <http://www.arrl.org/logbook-of-the-world>)

There are several other ones that are in use.

There are lots of different logging programs on the market. Some are specialized for contest operation like N1MM and WriteLog. Others work with mixed activities like the N3FJP

which includes a general purpose logger. There are lots of general purpose loggers for your normal daily use. Some come in a package with other programs that do digital modes like Ham Radio Deluxe. eHam has reviews on dozens of these programs ranging from free to \$200 at <https://www.eham.net/reviews/products/27> You can give most of these a try before committing to one.

Virtually all of the programs save or can retrieve the data in ADIF format (Amateur Data Interchange Format) which allows transfer of the information between different programs. For instance, I take the ADIF file from my WSJT-X program and send it to LOTW to log it and give credit for the contacts to other hams who have also uploaded their logs to LOTW. I can also download an ADIF file from my N1MM logger after a contest to LOTW. Any of the almost 400 contacts who worked me during the NVQSO Party can get confirmation of Pershing County for the county hunter awards or DN10 for the International Grid Chase, or Nevada for WAS... Another nice thing about ADIF is you can copy your log from one logging program to another if you want to change. I have about 10,000 contacts logged on LOTW and I could transfer all of those to another program if I needed to...

That brings up the point about maintaining a backup of your log files. Saving a copy of all your logs on multiple hard drives on different computers is a good start. Cloud storage is inexpensive and secure, and since that is not at your home and connected to large lightning rods (antennas...), it is likely to survive to be reinstalled on another computer. Now if there were only an easy way to backup the radio equipment against the lightning...

One of the big advantages to having the log data is that you can analyze the results of your activity. If you are participating in contests, you can look a previous year's data and see what times and bands were the most productive. Some programs have these analytics built in. Other programs can instantly fill your screen with all sorts of information like the contact's name, address, license class, if you have worked them before and if you have received QSO confirmation for that previous contact.

Logging contacts can add to your ham radio experience!

KIDS DAY - YOUTH INVOLVEMENT

The January 5th, 2019 **Kids-Day** events are upcoming. There are 4 ways you can participate:

1. **INDIVIDUALLY:** Go to snars.org on the left side of the home page click Kids-Day MORE INFORMATION button which will take you to the ARRL Kids-Day webpage. Here you can learn how to engage with kids in your own area.
2. **BREAKFAST:** Attend the SNARS breakfast meeting Jan 5th 8:00AM at Boomtown where there will be a presentation with Kids.
3. **CABELA'S:** Come to Cabela's (right next to Boomtown) where will be having a **"Get the KIDS on the Air"** event in front of Cabela's. Setup around 9:30AM and run Kids-Day there at 10AM for a few hours.
4. **SCOUTS:** Will be having a **"Get the SCOUTS on the Air"** event from 2PM till 4PM at the Cold Springs Valley Volunteer Fire Department, 250 South Avenue, Reno.



Additional Youth Event:

BOYS & GIRLS CLUB on Friday January 11, 2019

In addition to Kids-Day, we will be having a **"Get the BOYS & GIRLS on the Air"** event from 9AM till 11AM on Friday, January 11, 2019 at the Boys & Girls Club of Truckee Meadows, 2680 E 9th St, Reno.

To sign up for the Cabela's, Scouts, or Boys and Girls Club events or for more info, click here bit.ly/hamyouth2019

73, Barry K6ST k6st@arrl.net

Nevada Section Youth Coordinator - ARRL (American Radio Relay League)

SNARS LOGO ITEMS

This year we are celebrating our 50th year by providing many ways to commemorate this occasion by imprinted our 50th



Stickers \$1.00 Each



16oz Coffee Mugs \$8.00



Hats \$10.00



Club Badge \$15.00

Order at
<http://snars.org/store/badge-order>

Items are available at the monthly meetings, events or online (coming soon) <http://snars.org/store>

MIKE'S MISSIVES CHAPTER FORTY ONE

Mike Katz, N7MSK

Ham Radio and the "10 Code"

Hams never used ten codes. The occasional exception was, after CB was created in 1958, a ham who was also a CBer may have slipped now and then and used one accidentally. It was not until the mass move of CBers into ham radio following the 1991 creation of the code free ham license that 10-codes became more evident on the ham radio frequencies.

Those of us who have worked in law enforcement and other similar occupations are familiar and comfortable with the 10 code – For the most part, with a few exceptions, the 10 code does not address many of the needs of ham radio operators. Here is a list of the most common of the codes that could be used by hams.

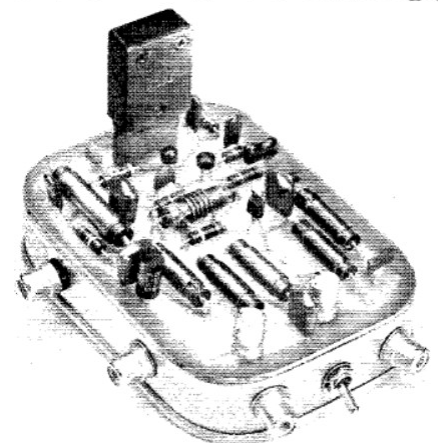
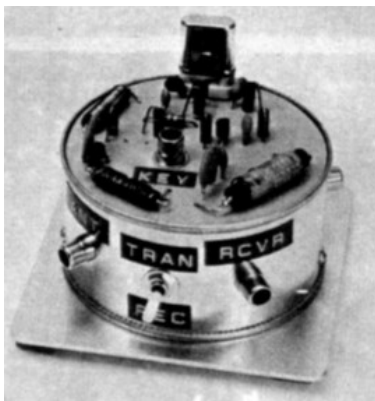
- 10-1 = Poor reception
- 10-2 = Good reception
- 10-3 = Stop transmitting
- 10-4 = Message received, affirmative, OK
- 10-5 = Relay this information to (name of person, officer, etc.)
- 10-6 = Busy
- 10-7 = Out of service
- 10-8 = In service
- 10-9 = Please repeat, please repeat the message
- 10-10 = Negative (no)
- 10-11 = Dog case
- 10-12 = Standby

There are many more but they would be of no use in a non-law enforcement environment.

(Editor's note: Back in the 80s and 90s it was not uncommon to hear on a repeater, someone asking "What's your 20?", referring to the 10-20 code, inferring location. Usually asked by a newbie who might also use the phrase "I'm destined", erroneously meaning "I'm at my destination." There is a word "destinate" but its meaning has nothing to do with location or destination.)

* * * * *

NAME THESE RIGS



(Answers on pg 10)

DECEMBER MEETING PHOTOS

BY W7SSB



LEFT The December breakfast meeting. White chair covers, centerpieces, did we crash someone's wedding??

RIGHT A nice crowd for a chilly blustery December morning.



LEFT Another shot of the crowd.

RIGHT Don Sherman W7SSB talks up the new MFJ-2289 portable general coverage antenna, sitting on an MFJ-1918 tripod.



ON TUNING MAG LOOP ANTENNAS

I like to experiment with antennas. One particular type I play with is the magnetic loop antenna (or “mag loop”.) A mag loop is a very short antenna, less than $\frac{1}{4}$ wavelength, typically $\frac{1}{10}$ w.l. or less, shaped in a loop – square, octagonal, round, etc., and usually operated vertically. The most common mag loop construction is a copper pipe loop, open at the top. A high voltage air-type tuning capacitor is across the opening. A small feed loop is at the bottom, where the signal is coupled to the main loop and radiated.

A mag loop, done right, can be fairly efficient, but it's subject to the “two out of three” simple antenna syndrome: A simple antenna can be any two of three of the following: **electrically small, broad banded, or efficient**. It can never be all three. A dummy load, for example, is a broad band antenna, and electrically small. It sure is not efficient. A good mag loop is electrically small, and efficient, but it's VERY narrow banded. A good 20 meter mag loop will have a typical bandwidth around 30-35 KHz, or about 10 percent of the 20 meter band. That bandwidth doesn't nearly cover either the CW/digital portion of the phone portion without adjusting the loop.

The capacitor often used for a mag loop is a vacuum adjustable type – very expensive, especially if it isn't really the right range for the job. I, being cheap, opt for a standard split-stator capacitor. They're way more readily available, and flea markets usually produce a quantity of them for little \$\$\$\$. The problem with a split stator type (or any manually rotated air type) is that the full range of capacitance available is covered over just $\frac{1}{2}$ of one turn of the shaft. A 20 meter mag loop will normally require a maximum capacitance of 40 to 100 pF depending on the physical size of the loop. Coverage of the full 20 meter band takes about 2 to 5 pF adjustment, about 2.5% of the total shaft rotation. Adjusting the loop to cover the next

30 KHz of the band to what you are tuned to requires just a small fraction of a pF change, not hard to do on the expensive vacuum capacitor with its 20 or 30 turn shaft adjustment, but really hard to do accurately on an air cap that only rotates a $\frac{1}{2}$ a turn min to max.

The capacitor on a mag loop must be able to withstand very high voltage (typically 3 to 4 KV RMS with a 100 watt signal), and currents up to 20 amps or so, thus it must be well constructed. To make adjustment easier once a loop is in the general band range, I use a simple 6 inch copper arm connected to one side of the loop opening. This arm is movable, rotating about one end, and can come very

close to the other side of the loop opening in the horizontal position, or perpendicular to the loop opening in the vertical position. I spring-load the pivot of the arm so it can be adjusted without loosening anything, yet remains in whatever position I set it to. This arm has a total capacitance range of about 3 pF, meaning that fraction of a pF adjustment needed to set my loop to the next higher or lower 30KHz actually covers more than $\frac{1}{4}$ inch, easily set

by eye. I could make it fancier, adding a knob and graduations on a dial plate, but for my purposes eye-adjustment is OK. By knowing what center freq my loop is tuned to, vs. where I want to be, how many “ $\frac{1}{4}$ inch” segments I need to move the arm is easy to calculate and do.

Because my adjustment arm is only a few pF, it handles very little of the high total current in a loop antenna, and the high voltage issue is kept at bay simply by keeping the open end of the arm a $\frac{1}{4}$ inch or so away from the opposite side of the loop opening. Construction need not be anything fancy or complicated for either factor, and because I operate my mag loops near ground level (there's no real advantage to placing a loop up really high), QSYing is quick and easy. 73, WB2AWQ



FUN STUFF FOR JANUARY

January is notably slim on contests. Five events in January are NCJ or ARRL-sponsored, (shown in bold) thus possibly qualifying for the ARRL Gavel Award.

2 Jan 2300 to 6 Jan 2300 1.8-7 AWA Linc Cundall Memorial CW Contest www.antiquewireless.org

5 Jan 1800 to 6 Jan 2359 3.5-28 ARRL RTTY Roundup
www.arrl.org/rtty-roundup

12 Jan 0500 to 12 Jan 0900 3.5-28 Old New Year Contest CW
Phwww.radio.ru/cq/contest/rule-results/index7.shtml

12 Jan 1800 to 13 Jan 0559 1.8-28 North American QSO Party, CW CW Name, SPC www.ncjweb.com

13 Jan 1300 to 16 Jan 0700 1.8-144 Classic Exchange, CW
www.classicexchange.org

19 Jan 1800 to 20 Jan 0559 1.8-28 North American QSO Party, SSB www.ncjweb.com

19 Jan 1900 to 21 Jan 0359 50 and up ARRL January VHF Contest CW Ph Dig www.arrl.org/january-vhf

25 Jan 2200 to 27 Jan 2200 1.8 CQ 160-Meter Contest, CW
www.cq160.com

26 Jan to 1900 Jan 27 1900 All, no WARC Winter Field Day CW
Ph Dig www.winterfieldday.com

A complete list of contests is available at:
<http://www.arrl.org/files/file/Contest%20Corral/2019/January%202019%20Corral.pdf>

I included the Old New Year contest (Jan 12) as sort of a lark—check out the link to see why SNARS members might do really well in this one!

If you're not into contests, there's always DX to chase, but January is kind of slim! Some of the better DX operations coming up in January:

Jan 09 to Jan 21 **Sierra Leone 9LY1JM**

Jan 17 to Jan 29 **Chatham I ZL7**

Jan 18 to Feb 14 **Rwanda 9X2AW**

Jan 25 to Jan 28 **Palau T88PB**

See <https://www.ng3k.com/Misc/adxo.html> for more DX operations.

For non-weekend contest, non-DX stuff, try these:

5 Jan 1800 to 5 Jan 2359 3.5-14,18, 21, 24, 28, 144 repeaters ARRL Kids Day www.arrl.org/kids-day

See also Barry K6ST's info page elsewhere for more info on ARRL Kids Day!

NAME THESE RIGS (from pg 7)

If you think there's something "fishy" going on here, you're right! In the May, 1976 issue of QST, Doug DeMaw (then W1CER), W1FB (SK) laid out his **"Tuna Tin-2" 40 meter QRP transmitter**. It was an exceedingly simple yet well engineered unit, built on a circuit board cut in a circle to fit on the standard tuna fish can. With just two transistors and a handful of parts all available from your local Radio Shack for the princely sum of \$10.00 (that's a story in itself...) except for the tuna fish, the beginner QRP enthusiast could replicate and easily get the Tuna Tin-2 putting out in excess of 350 milliwatts, enough for contacts out to hundreds of miles.

Not to be outdone, in July of 1976, Jay Rusgrove WA1LNQ, another prolific QST contributor in the day, came up with the mating 40 meter receiver, the **"Herring Aid Five" five transistor direct-conversion receiver** built on an oval-shaped herring can. Once again, the watchwords were simplicity and easy replication. Parts, of course, all available from Radio Shack.

Then, in September, 1978, in apparent demand for a similar 80 meter transmitter, DeMaw introduced the **"Sardine Sender" 80 meter QRP transmitter**, built on – you guessed it – a sardine can. This was an improved version of the Tuna Tin, with 3 transistors and 750 milliwatts out, still a very simple yet well engineered design, staying with Radio Shack as the parts supplier.

While there was some selection of QRP transmitters and simple receivers on the market in those days, it is your Editor's opinion that these three units, often duplicated by both intrepid QRP enthusiasts and manufacturers alike, heralded the explosion of QRP transmitter, simple receiver, and even transceiver kits by many small kit-makers which have enjoyed popularity for decades. A quick google search will reveal a dozen or more kit companies inspired by these QST classics. For certain, these designs figured prominently inspiring Oak Hills Research, Norcal, NJ QRP and other small manufacturers. Yours truly built his own "Tuna Tin-2" – although not in a tuna tin – in the late 70s, and had a ball on 40 meters, reaching the west coast from NJ with just 400 mW out. Apologies for the fuzzy pictures, but there are no good photos of the originals that I could find.WB2AWQ

JIM SHEPHERD'S SHORT TAKES.....

Ham Radio Night, January 2, 2019

This will be an open discussion night which is a good time to ask questions about any facet of the hobby. If you have questions about gear you got for Christmas, this is a good time to try and get them answered.

RTTY Roundup, January 5-6, 2019

The ARRL RTTY Roundup contest will run from 1800z (10 am PST) on Saturday until 2359z (3:59 pm) on Sunday. This year there will be a lot of activity on FT8 due to the inclusion of the new contest modes in the WSJT-X program. You will need to have the latest 2.0 version of the software as the older versions will not work. Full information is at <http://www.arrl.org/rtty-roundup>

ARRL Section Manager Nominations

Nominations for the Nevada Section Manager are due by March 8, 2019. Nominating petitions and further information can be found at <http://www.arrl.org/section-terms-nomination-information>

Winter Field day

January 26-27, 2019 A similar event to the June Field Day with potentially nastier weather. Get a group together and have some outdoors fun in the dead of winter. Rules and further information are at <http://www.winterfieldday.com/>

W7SSB's FUN STUFF

Simple vertical antenna for both base and portable use !

Will handle 1KW SSB PEP.....

Breaks down for easy carrying and storage !

Covers 40 - 2 meters Depending on telescopic element !

Parts:

Chameleon CHA SS Spike Mount.



33' - Wire With Winder Counterpoise .



MFJ - 67, Hi Q Air Wound Loading Coil 2" x 6" .



**MFJ - 1979 (17'), 1977 (12'), 1976 (10'), 1974 (8'), 1972 (4.5')
Telescoping Antennas**

(Chose the telescoping element for the bands you want to mostly use).



Easy to tune and use ! Can mount on tripod or mount on table or railing with suitable mount



Bring it out at night and use the spike and stick it in the ground if you have restrictions !



Build it and have fun !

73,

Don W7SSB

ARES NEWS

ANNUAL COMMUNICATIONS CALENDAR 2019

EVENT 2019	DATE	DATE END	SPONSOR/ORGANIZER	COORDINATOR	CONTACT
Reno 5000-1	4/6/19		Dolan Auto Group	Bob Miller WA6MTY	wa6mty@gbis.com
SAGAN FONDO	5/4/19		Peter Sagan	Bob Miller WA6MTY	wa6mty@gbis.com
Silver State 50/50 race	5/18/19		Silver State Striders	Steve KS6A	ks6a@sbcglobal.net
Indian Valley Century Bicycle Ride	????		Plumas ARC	Larry Trotter KI6YUK	dltrotter@sbcglobal.net
Lost and Found Gravel Grinder SBTS	6/1/19		Plumas ARC	Brian KJ6EAC	brianv@psln.com
America's Most Beautiful Bike Ride	6/2/19		Tahoe Amateur Radio Assn	Paul Gulbro, WA6EWV	wa6ewv@juno.com
Pony Express Re-Ride	6/10/2019	6/20/19	SIERA	Jeff Cauhape K7BCV	j_cauhape@yahoo.com
RENO 5000-2	6/30/19		WC-ARES	Bob Miller WA6MTY	wa6mty@gbis.com
Alta Alpina Challenge	6/30/19		Alta Alpina Cycling Club	Jennie Hamiter, KE7YBA	jenniehamiter@mac.com
Death Ride	7/13/19		Tahoe Amateur Radio Assn	Paul Gulbro, WA6EWV	wa6ewv@juno.com
Tahoe Rim Trail	7/20/19	7/22/19	Tahoe Mountain Milers	Bob Miller WA6MTY	wa6mty@gbis.com
NVCON 2019	7/20/19	7/22/19	SNARS	Tony W7XM	w7xm@snars.org
Round Valley Walk/Run	????		Plumas ARC	Larry Trotter KI6YUK	dltrotter@sbcglobal.net
Running With the Bears	8/17/19		Plumas ARC	Larry Trotter KI6YUK	dltrotter@sbcglobal.net
Vegas to Reno Off Road Race	8/14/19	8/17/19	Best in the Desert Racing Assn	Keith KC7HTK	kc7htkeith@hotmail.com
RENO 5000-3	8/25/19		WC-ARES	Bob Miller WA6MTY	wa6mty@gbis.com
Tour De Tahoe	9/8/19		Tahoe Amateur Radio Assn	Paul Gulbro, WA6EWV	wa6ewv@juno.com
Reno Air-Races	9/8/15	9/15/19	WC-ARES	Bob Miller WA6MTY	wa6mty@gbis.com
Bear Growl Gravel Grinder	9/14/19		Plumas ARC	Larry Trotter KI6YUK	dltrotter@sbcglobal.net
Edible Pedal 100	9/15/19		Sunrise Rotary Club	Bob Miller WA6MTY	wa6mty@gbis.com
Stetina's Sierra Prospect	9/21/19		John Prouty	Bob Miller WA6MTY	wa6mty@gbis.com
Grinduro SBTS	9/28/19		Plumas ARC	Larry Trotter KI6YUK	dltrotter@sbcglobal.net
Nevada Day Parade	10/26/19		NV AREA NW DEC	John Abrott KD7NHC	jabrott77@gmail.com , cell 775 790-1739
Turkey Trot	11/28/19		WC-ARES	Bob Miller WA6MTY	wa6mty@gbis.com

NOTE: Plumas ARC always have a need for operators. Go over to some beautiful country and help out the Plumas Amateur Radio Club

Notes from Bob:

PASS THE WORD: 2019 One Day Ham Cram test reviews: Feb 16, May 18, Aug 17, Nov 16 Go to <https://snars.org/oneday/> and register so I know how many handouts to order. Also check out <https://snars.org/exams/> for requirements and info needed for testing the day of the ham cram.

Remember July 1 the GENERAL test changes.

(Editor's note: The current General Q and A book can be ordered from the ARRL, or you can find the question pool here online: <http://www.ncvec.org/downloads/FINAL%20Revised%202015-2019%20General%20Class%20Question%20Pool%202-11-2015.pdf> This pool expires on June 30, 2019)

COUNTY	REPEATER	COUNTY	REPEATER	COUNTY	REPEATER	COUNTY	REPEATER
Alpine, Ca	147.33	Douglas	147.33	Pershing	147.03	Washoe	147.15
	146.94		147.27		147.18		147.21
	147.24		147.24	Placer, Ca	147.24		147.03
	147.27		146.865	Plumas, Ca	147.15		147.18
	146.865	Eldorado, Ca	147.24		147.21		146.61
Churchill	147.15	Lassen, Ca	147.18	Sierra, Ca	147.15		147.39
	147.21				147.33		
	147.03	Lyon	146.97	Storey	147.15	EchoLink and IRLP	146.895
	147.18		146.61		147.21		147.3
	146.97		147.15		147.03	DMR	TALK GRPS
Carson City	146.61	Mineral			147.18		
	146.94	Modoc, Ca			146.61		
	147.39	Mono, Ca			147.39		
	147.27	Nevada, Ca	147.15		146.85		

EDITOR'S NOTE: NO DECEMBER BOARD MEETING MINUTES RECEIVED